

PATENT APPLICATION
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

Docket No: Q96062

Osamu IWASAKI

Appln. No.: 10/588,935

Group Art Unit: 2875

Confirmation No.: 2409

Examiner: Danielle N. Dunn

Filed: August 9, 2006

For: LIGHT GUIDE PLATE, AND PLANAR LIGHTING DEVICE AND LIQUID CRYSTAL
DISPLAY DEVICE USING THE SAME

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

MAIL STOP APPEAL BRIEF - PATENTS

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. § 41.37, Appellant submits the following:

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APPEAL BRIEF UNDER 37 C.F.R. § 41.37
U.S. Application No.: 10/588,935

Attorney Docket No.: Q96062

I. REAL PARTY IN INTEREST

The real party in interest is FUJIFILM Corporation, by way of an Assignment recorded on August 9, 2006 at Reel 018178, Frame 0454.

II. RELATED APPEALS AND INTERFERENCES

To the knowledge and belief of the Appellants, the Assignee, and the undersigned, there are no other appeals or interferences before the Board of Appeals and Interferences that will directly affect or be affected by the Board's decision in the instant Appeal.

III. STATUS OF CLAIMS

Claims 1-26 are all the claims currently pending in this Application. Claims 1-26 are currently rejected.

Claims 1-3, 5-18, 21, 23, 25, and 26 are finally rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over JP 08-062426 to Aihara et al. (hereinafter “Aihara”) in view of JP 05-249320 to Furukawa et al. (hereinafter “Furukawa”). Claim 4 is finally rejected as allegedly being unpatentable over Aihara, Furukawa, and JP 11-149073 to Kunishige. Claim 19 is finally rejected as allegedly being unpatentable over Aihara, Furukawa, and U.S. Publication No. 2003/0210210 to Ide et al. (hereinafter “Ide”). Claim 22 is finally rejected as allegedly being unpatentable over Aihara, Furukawa, and U.S. Patent No. 5,402,324 to Yokoyama et al. (hereinafter “Yokoyama”). Claims 20 and 24 are finally rejected as allegedly being unpatentable over Kunishige.

No other grounds of rejection or objection currently are pending. This Appeal is directed to the rejected claims 1-26.

IV. STATUS OF AMENDMENTS

With the filing of this Brief, all Amendments have been entered and considered by the Examiner.

The Application was originally filed with claims 1-24. Appellants filed an Amendment under 37 C.F.R. § 1.111 on January 29, 2008, in which claims 1, 3, 20, 21, and 24 were amended, and claims 25 and 26 were added. These amendments were entered and considered by the Examiner.

Appellants also filed a Response under 37 C.F.R. § 1.116 on June 27, 2008, in which no claims were amended.

The Appendix included with this Brief, setting forth the claims involved in the Appeal, reflects the claim changes made during prosecution of this Application.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Appellants' invention relates to a transparent light guide plate for diffusing light from a bar-like light source and emitting even illumination from the light exit surface of the transparent light guide plate (page 1, lines 7-11). The transparent light guide plate may be used in a planar lighting device and a liquid crystal display device (page 1, lines 11-12). The claimed subject matter of independent claims 1, 3, 20, 21, 24, and 25 is exemplified in Figs. 1A, 1B, and 16B and the descriptions thereof in the specification.

Figs. 1A and 1B illustrate an exemplary embodiment of a liquid crystal display device 10 according to Appellants' invention (page 17, lines 29-25). As shown in Figs. 1A and 1B, the liquid crystal display device 10 includes a backlight unit 2, a liquid crystal display panel 4 disposed on a light exit surface of the backlight unit 2, and a drive unit 6 for driving the backlight unit 2 and the liquid crystal display panel 4 (page 17, lines 25-29). The backlight unit 2 includes a planar lighting device for evenly irradiating the entire surface of the liquid crystal display panel 4 (page 17, lines 30-32). The planar lighting device includes a light guide plate 18, a bar-like light source 12 in a parallel groove 18f of the light guide plate 18, a reflector 20 behind the bar-like light source 12, a reflective sheet 22 on inclined rear surfaces 18d of inclined rear portions 18e of a thick portion 18b of the light guide plate 18, and a diffusion sheet 14 arranged on or above the light exit surface 18a of the light guide plate 18 (page 18, line 1 - page 19, line 29).

As shown in Fig. 1B, the light guide plate 18 includes the rectangular light exit surface 18a, the thick portion 18b at substantially a central portion of the rectangular light exit surface 18a in parallel with opposing two sides of the rectangular light exit surface 18a, and thin edge

portions 18c formed in parallel on both sides of the thick portion 18b (page 23, lines 9-17). The light guide plate 18 also includes the parallel groove 18f that accommodates the bar-like light source 12 and is formed at substantially the center of the thick portion 18b in parallel with the opposing two sides, and inclined rear portions 18e that are symmetrical with respect to a plane including a central axis of the bar-like light source 12 and perpendicular to the rectangular light exit surface 18a, and whose thickness is reduced from the thick portion 18b toward the thin edge portions 18c in a direction perpendicular to the opposing two sides to thereby form inclined rear surfaces 18d on both sides of the parallel groove 18f (page 23, lines 14-25). The light guide plate 18 is formed of a single material with a uniform index of refraction (Fig. 1B). As shown in Fig. 16B, a light guide plate may be formed from two or more light guide plates 18 that are connected with each other at thin edge portions 18c thereof (page 37, lines 23-27).

Fig. 1B shows that an end portion of the parallel groove 18f is narrowed toward the rectangular light exit surface 18a symmetrically with respect to a center line of the parallel groove 18f and perpendicular to the rectangular light exit surface 18a in a sectional shape of the parallel groove 18f (page 25, lines 9-16). For example, the sectional shape of the parallel groove 18f may be triangular as shown in Fig. 1B, hyperbolic as shown in Fig. 3, or elliptical as shown in Fig. 4 (page 25, lines 5-9 and 17-18). Figs. 10, 11, and 13 show illuminance distributions of light emitted from the rectangular light exit surface 18a of the light guide plate 18 for different sectional shapes of the parallel groove 18f, including embodiments in which the top of the parallel groove is flattened as shown in Figs. 12A-12D.

Based on the illuminance distributions discussed above, the Appellants designed the sectional shape of the parallel groove 18f of the light guide plate 18 to adjust the illuminance to an optimum value and to make the illuminance distribution uniform across the rectangular light exit surface 18a of the light guide plate 18 (page 32, line 29 - page 33, line 4). Specifically, the end portion of the parallel groove 18f is narrowed in accordance with a ratio of the peak value of the illuminance (or luminance) of light emitted from the bar-like light source 12 at a first portion of the rectangular light exit surface 18a corresponding to the parallel groove 18 to an average value of the illuminance (or luminance) at second portions of the rectangular light exit surface 18a corresponding to the inclined rear portions 18e (page 33, line 24 - page 34, line 2). The peak value may be three or less times as large as the average value (page 35, lines 2-8). The luminance is approximately equal to the illuminance on the rectangular light exit surface 18a of the light guide plate 18 (page 33, lines 5-13).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The issues on appeal are whether the Examiner improperly finally rejected claims 1-3, 5-18, 21, 23, 25, and 26 as unpatentable over Aihara and Furukawa; claim 4 as unpatentable over Aihara, Furukawa, and Kunishige; claim 19 as unpatentable over Aihara, Furukawa, and Ide; claim 22 as unpatentable over Aihara, Furukawa, and Yokoyama; and claims 20 and 24 as unpatentable over Kunishige.

VII. ARGUMENT

I. Claim Rejections Under 35 U.S.C. § 103(a)

A. Claims 1-19, 21-23, 25, and 26

Claims 1-3, 5-18, 21, 23, 25, and 26 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Aihara and Furukawa. Claim 4 stands rejected as allegedly being unpatentable over Aihara, Furukawa, and Kunishige. Claim 19 stands rejected as allegedly being unpatentable over Aihara, Furukawa, and Ide. Claim 22 stands rejected as allegedly being unpatentable over Aihara, Furukawa, and Yokoyama. Appellants respectfully traverse these grounds of rejection.

Aihara is directed to a backlight of a liquid crystal display (§ [0001]). As shown in Figs. 1 and 2 of Aihara, the light guide plate 11 has a rectangular light exit surface (§ [0008]). The light guide plate 11 is thicker at a central portion and thinner at the edges (§ [0008]). A rectangular-shaped slot 14 accommodates a fluorescent tube 12 in the center of the light guide plate 11 (§ [0008]). The light guide plate 11 appears to be formed of a single material with a uniform index of refraction.

Furukawa is directed to an optical waveguide device for surface illumination. As shown in Figs. 1-5 of Furukawa, the optical waveguide device includes a low refractive index layer 4 and a plurality of tabular lightguides 5a, 5b, 5c, 5d, 5e, and 5f (§ [0027]). The first tabular lightguide 5a has the lowest index of refraction N1, and the remaining tabular lightguides 5b, 5c, 5d, 5e, and 5f have successively higher indices of refraction N2, N3, N4, N5, and NK, respectively (§ [0029]). Furukawa uses the tabular lightguides 5a, 5b, 5c, 5d, 5e, and 5f with

increasing indices of refraction to achieve a uniform brightness at the surface of the optical waveguide device (¶¶ [0021] – [0022], [0047]). As shown in Figs. 1, 2, and 5, there may be a triangular-shaped dead air space for light sources 8 through the tabular lightguides 5a, 5b, 5c, 5d, 5e, and 5f. Alternatively, the dead air space for light sources 8 may be concave (Fig. 3) or circular (Fig. 4).

Claim 1 recites a transparent light guide plate in which “an end portion of said parallel groove is narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface” (emphasis added). In rejecting claim 1, the Examiner concedes that Aihara fails to teach or suggest the claimed narrowed parallel groove. Instead, Figs. 1 and 2 of Aihara show that the slot 14 has a rectangular-shaped cross section in which the vertical sides are parallel. However, the Examiner maintains that it would have been obvious to a person of ordinary skill in the art to modify the slot 14 of Aihara to have an inverted V-shape as disclosed in Furukawa. According to the Examiner, the motivation for modifying Aihara would have been to increase the luminance of the light guide plate 11. Appellants respectfully disagree.

Appellants submit that the Examiner is using impermissible hindsight in combining only the shape of the parallel groove of Furukawa with the light guide plate of Aihara. A person of ordinary skill in the art would not have been motivated to modify Aihara based on the teachings of Furukawa to achieve the claimed invention, because Furukawa uses the tabular lightguides 5a, 5b, 5c, 5d, 5e, and 5f with increasing indices of refraction to achieve a uniform brightness at the

surface of the optical waveguide device, whereas the light guide plate of Aihara is formed of a single material with a uniform index of refraction. A person of ordinary skill in the art would not have modified the slot 14 of Aihara to have an inverted V-shape without also modifying the light guide plate of Aihara to include a series of materials with increasing indices of refraction. This would be contrary to the claims of the present invention, which recite that the light guide plate is formed of a single material with a uniform index of refraction.

Claim 1 also recites that the narrowing of the parallel groove is “in accordance with a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions.” The Examiner concedes that neither Aihara nor Furukawa discloses that the parallel groove is narrowed based on the claimed ratio. However, the Examiner maintains that it would have been obvious to narrow the V-shaped groove of Furukawa based on the claimed ratio, because “where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only ordinary skill in the art.” Appellants respectfully disagree.

The MPEP states: “A particular parameter must be first recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation.” (MPEP § 2144.05 (II)(B), *citing In re Antonie*, 559 F.2d 618 (CCPA 1977)). The claim at issue in *In re Antonie* recited a wastewater treatment device that had a ratio of tank volume to

contractor area of 0.12 gal./sq.ft. The prior art did not recognize that the desired result (large treatment capacity) was a function of the ratio of the tank volume to the contractor area. Thus, the court held that the parameter (ratio of tank volume to contractor area) that would have to be optimized to achieve the claimed limitation was not recognized in the art to be a *result-effective variable*. (*Id.*)

Similarly, none of the cited art recognizes that *any* desired result is a function of the sectional shape of the parallel groove. For example, none of the cited art recognizes that adjusting the sectional shape of the narrowed parallel groove would affect the amount or distribution of luminance from the light guide plate. On the contrary, Furukawa uses the tabular lightguides 5a, 5b, 5c, 5d, 5e, and 5f with increasing indices of refraction to achieve a uniform brightness at the surface of the optical waveguide device (¶¶ [0021] – [0022], [0047]).

Therefore, the sectional shape of the narrowed parallel groove recited in the claims is not recognized in the art to be a *result-effective variable*. Consequently, it would not have been obvious to a person of ordinary skill in the art to optimize this parameter. Specifically, it would not have been obvious to a person of ordinary skill in the art to narrow the parallel groove based on the recited ratio.

In response to the above arguments, the Examiner asserts that Appellants are arguing an inherent property of Aihara and Furukawa. Appellants respectfully disagree. Evidence of inherency in a reference “must make it clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.” MPEP § 2112 IV (emphasis added). On the contrary, Appellants submit that a

parallel groove that is narrowed in accordance with the claimed ratio is not necessarily present in any of the cited references, and is therefore not an inherent property of the cited references.

Appellants submit that claim 1 is patentable over Aihara and Furukawa at least by virtue of the reasons discussed above. Further, Kunishige, Ide, and Yokoyama each fail to remedy the deficient teachings of Aihara and Furukawa. Therefore, claim 1 is patentable over Aihara, Furukawa, Kunishige, Ide, and Yokoyama at least by virtue of the reasons discussed above. Because independent claims 3, 21, and 25 recite features similar to those discussed above with regard to claim 1, Appellants submit that claims 3, 21, and 25 are patentable over Aihara, Furukawa, Kunishige, Ide, and Yokoyama at least for similar reasons. Further, claims 2, 4-18, 22, 23, and 26 are patentable over Aihara, Furukawa, Kunishige, Ide, and Yokoyama at least by virtue of their respective dependencies on claims 1, 21, and 25, as well as their additionally recited features. Further, Appellants note that the Examiner has not specifically addressed the patentability of the method steps recited in claims 25 and 26.

B. Claims 20 and 24

Claims 20 and 24 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kunishige. Appellants respectfully traverse this ground of rejection.

Kunishige is directed to a surface light source device and a liquid crystal display device. Figs. 1 and 2 of Kunishige show that there is a gap between the light transmission plates 4 and 5 of the surface light source device, and that a light source 3 is positioned within the gap (¶ [0027]). Like the slot 14 of Aihara, the gap of Kunishige has a rectangular-shaped cross section (Figs. 1 and 2 of Kunishige).

Independent claims 20 and 24 recite a light guide plate in which “an end portion of said parallel groove is narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface” (emphasis added). Appellants submit that Kunishige fails to teach or suggest the quoted claim feature. Instead, Figs. 1 and 2 of Kunishige show that gap between the light transmission plates 4 and 5 in which the light source 3 is positioned has a rectangular-shaped cross section in which the vertical sides are parallel, such that the distance between the vertical sides is a constant. Although the reflection plate 7 of Kunishige has a V-shaped groove, the reflection plate 7 is not part of the light transmission plates 4 and 5, and the light source 3 is not accommodated in the V-shaped groove, as recited in claims 20 and 24.

Further, Appellants submit that Kunishige fails to teach or suggest that the narrowing of the parallel groove is “in accordance with a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions,” as recited in claims 20 and 24.

As discussed above, the sectional shape of the narrowed parallel groove recited in claims 20 and 24 is not recognized in the art to be a *result-effective variable*. Consequently, it would not have been obvious to a person of ordinary skill in the art to optimize this parameter. Specifically, it would not have been obvious to a person of ordinary skill in the art to narrow the

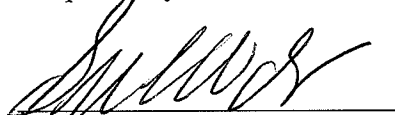
parallel groove based on the ratio recited in claims 20 and 24. Therefore, Appellants submit that claims 20 and 24 are patentable over Kunishige at least by virtue of the aforementioned differences, as well as their additionally recited features.

II. Conclusion

In view of the arguments advanced above, Appellants respectfully submit that the Examiner has failed to establish a *prima facie* case of unpatentability for claims 1-26. In particular, claims 1-26 are patentable over Aihara, Furukawa, Kunishige, Ide, and Yokoyama. Appellants request reversal of the outstanding rejections.

The USPTO is directed and authorized to charge the statutory fee (37 C.F.R. §§ 41.37(a) and 1.17(c)) and all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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CLAIMS APPENDIX

CLAIMS 1-26 ON APPEAL:

1. (previously presented): A transparent light guide plate, comprising:
a rectangular light exit surface;
a thick portion positioned at substantially a central portion of said rectangular light exit surface in parallel with opposing two sides of said rectangular light exit surface;
thin edge portions formed in parallel on both sides of said thick portion;
a parallel groove which accommodates a bar-like light source and is formed at substantially a center of said thick portion in parallel with said opposing two sides; and
inclined rear portions which are symmetrical with respect to a plane including a central axis of said bar-like light source and perpendicular to said rectangular light exit surface, and whose thickness is reduced from said thick portion toward said thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on both sides of said parallel groove,
wherein an end portion of said parallel groove is narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface, in accordance with a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said

parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions, and

said light guide plate is formed of a single material with a uniform index of refraction.

2. (original): The light guide plate according to claim 1, wherein said end portion of said parallel groove is symmetrically narrowed such that a peak value of relative illuminance or relative luminance at said first portion of said rectangular light exit surface is three or less times as large as an average value of said relative illuminance or relative luminance at said second portions of said rectangular light exit surface.

3. (previously presented): A transparent light guide plate, comprising:
a rectangular light exit surface;
a thick portion positioned at substantially a central portion of said rectangular light exit surface in parallel with opposing two sides of said rectangular light exit surface;
thin edge portions formed in parallel on both sides of said thick portion;
a parallel groove which accommodates a bar-like light source and is formed at substantially a center of said thick portion in parallel with said opposing two sides; and
inclined rear portions which are symmetrical with respect to a plane including a central axis of said bar-like light source and perpendicular to said rectangular light exit surface, and whose thickness is reduced from said thick portion toward said thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on both sides of said parallel groove,

wherein an end portion of said parallel groove is narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface, in such a manner that a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove is three or less times as large as an average value of said illuminance or luminance of said emitted light at a second portion corresponding to said inclined rear portions, and

said light guide plate is formed of a single material with a uniform index of refraction.

4. (previously presented): The light guide plate according to claim 2, wherein the peak of relative illuminance or relative luminance at said first portion of said rectangular light exit surface is twice or less as large as said average value of said relative illuminance or relative luminance at said second portion of said rectangular light exit surface.

5. (previously presented): The light guide plate according to claim 1, wherein said end portion forms an angle of 90 degrees or less, said angle being obtained by combining two angles between both sides of said sectional shape of said parallel groove and a perpendicular line extending from a center of said bar-like light source toward said rectangular light exit surface.

6. (previously presented): The light guide plate according to claim 1, wherein said end portion forms an angle of 60 degrees or less, said angle being obtained by combining two

angles between both sides of said sectional shape of said parallel groove and a perpendicular line extending from a center of said bar-like light source toward said rectangular light exit surface.

7. (previously presented): The light guide plate according to claim 1, wherein said sectional shape of at least said end portion of said parallel groove is defined by part of two straight or curved lines symmetrical with respect to said center line of said parallel groove, which cross each other at an intersection as a peak.

8. (original): The light guide plate according to claim 7, wherein said two curved lines defining said sectional shape of at least said end portion of said parallel groove are convex or concave with respect to said center line of said parallel groove.

9. (previously presented): The light guide plate according to claim 7, wherein said two curved lines defining said sectional shape of at least said end portion of said parallel groove can be approximated by a tenth-order mathematical function and are convex or concave with respect to said center line of said parallel groove.

10. (previously presented): The light guide plate according to claim 7, wherein said two curved lines defining said sectional shape of at least said end portion of said parallel groove or said sectional shape of said parallel groove comprise part of circular, elliptical, parabolic, or hyperbolic lines, which are convex or concave with respect to said center line of said parallel groove.

11. (previously presented): The light guide plate according to claim 1, wherein said sectional shape of at least said end portion of said parallel groove or said sectional shape of said parallel groove is triangular.

12. (previously presented): The light guide plate according to claim 7, wherein said sectional shape at a top of said end portion of said parallel groove is defined by said two straight or curved lines symmetrical with respect to said center line cross each other and a straight or curved line symmetrical with respect to said center line which is connected to said two straight or curved lines before said two straight or curved lines cross each other.

13. (original): The light guide plate according to claim 12, wherein said sectional shape at said top of said end portion of said parallel groove has a portion parallel with said rectangular light exit surface where said intersection as the peak is chamfered.

14. (previously presented): The light guide plate according to claim 12, wherein said sectional shape of at least said end portion of said parallel groove or said sectional shape of said parallel groove is triangular, and said sectional shape at said top of said end portion of said parallel groove is a trapezoidal shape symmetrical with respect to said center line.

15. (original): The light guide plate according to claim 12, wherein said sectional shape at said top of said end portion of said parallel groove is a curved shape symmetrical with respect to said center line and convex or concave with respect to said rectangular light exit surface.

16. (previously presented): The light guide plate according to claim 12, wherein said sectional shape at said top of said end portion of said parallel groove is a circular, elliptical, parabolic, or hyperbolic shape obtained by rounding said intersection as the peak symmetrically with respect to said center line.

17. (previously presented): The light guide plate according to claim 1, wherein said sectional shape of at least said end portion of said parallel groove is defined by part of a elliptical or hyperbolic line.

18. (previously presented): The light guide plate according to claim 1, wherein said top of said end portion of said parallel groove is sanded.

19. (previously presented):: The light guide plate according to claim 1, wherein a halftone dot pattern is formed in a portion of said rectangular light exit surface corresponding to said top of said end portion of said parallel groove.

20. (previously presented): A light guide plate formed from two or more light guide plates, each comprising:

a rectangular light exit surface;

a thick portion positioned at substantially a central portion of said rectangular light exit surface in parallel with opposing two sides of said rectangular light exit surface;

thin edge portions formed in parallel on both sides of said thick portion;

a parallel groove which accommodates a bar-like light source and is formed at substantially a center of said thick portion in parallel with said opposing two sides; and

inclined rear portions which are symmetrical with respect to a plane including a central axis of said bar-like light source and perpendicular to said rectangular light exit surface, and whose thickness is reduced from said thick portion toward said thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on both sides of said parallel groove,

wherein an end portion of said parallel groove is narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface, in accordance with a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions,

said two or more light guide plates are connected with each other at said thin edge portions thereof, and

said two or more light guide plates are formed of a single material with a uniform index of refraction.

21. (previously presented): A planar lighting device comprising:
a light guide plate, comprising:

a rectangular light exit surface;

a thick portion positioned at substantially a central portion of said rectangular light exit surface in parallel with opposing two sides of said rectangular light exit surface;

thin edge portions formed in parallel on both sides of said thick portion;

a parallel groove which accommodates a bar-like light source and is formed at substantially a center of said thick portion in parallel with said opposing two sides; and

inclined rear portions which are symmetrical with respect to a plane including a central axis of said bar-like light source and perpendicular to said rectangular light exit surface, and whose thickness is reduced from said thick portion toward said thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on both sides of said parallel groove,

wherein an end portion of said parallel groove is narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface, in accordance with a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions;

a bar-like light source accommodated in said parallel groove of said light guide plate;

a reflector provided behind said bar-like light source to cover said parallel groove;

a reflective sheet provided on said inclined rear surfaces of said inclined rear portions on both sides of said thick portion of said light guide plate;

a diffusion sheet arranged on said rectangular light exit surface of said light guide plate,
and

said light guide plate is formed of a single material with a uniform index of refraction.

22. (original): The planar lighting device according to claim 21, further comprising a prism sheet arranged between said rectangular light exit surface of said light guide plate and said diffusion sheet.

23. (previously presented): The planar lighting device according to claim 21, wherein a ratio of a peak value of relative illuminance or luminance at a first portion of said rectangular light exit surface of said light guide plate to an average value of relative illuminance or luminance at a second portion of said rectangular light exit surface is determined in accordance with a permissible gap between said rectangular light exit surface of said light guide plate and said diffusion sheet, or a permissible thickness of said planar lighting device.

24. (previously presented): A liquid crystal display device, comprising:
a backlight unit including a planar lighting device;
a liquid crystal display panel arranged on a light exit surface side of said backlight unit;
and
a drive unit driving said backlight unit and said liquid crystal display panel,

wherein said planar lighting device comprises:

a light guide plate, comprising:

a rectangular light exit surface;

a thick portion positioned at substantially a central portion of said rectangular light exit surface in parallel with opposing two sides of said rectangular light exit surface;

thin edge portions formed in parallel on both sides of said thick portion;

a parallel groove which accommodates a bar-like light source and is formed at substantially a center of said thick portion in parallel with said opposing two sides; and

inclined rear portions which are symmetrical with respect to a plane including a central axis of said bar-like light source and perpendicular to said rectangular light exit surface, and whose thickness is reduced from said thick portion toward said thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on both sides of said parallel groove,

wherein an end portion of said parallel groove is narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface, in accordance with a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions;

a bar-like light source accommodated in said parallel groove of said light guide plate;
a reflector provided behind said bar-like light source to cover said parallel groove;
a reflective sheet provided on said inclined rear surfaces of said inclined rear portions on both sides of said thick portion of said light guide plate;
a diffusion sheet arranged on said rectangular light exit surface of said light guide plate,
and
said light guide plate is formed of a single material with a uniform index of refraction.

25. (previously presented): A method of forming a transparent light guide plate, wherein the transparent light guide plate comprises a rectangular light exit surface, the method comprising:

forming a thick portion positioned at substantially a central portion of said rectangular light exit surface in parallel with opposing two sides of said rectangular light exit surface;

forming thin edge portions in parallel on both sides of said thick portion;

forming a parallel groove which accommodates a bar-like light source and is formed at substantially a center of said thick portion in parallel with said opposing two sides; and

forming inclined rear portions which are symmetrical with respect to a plane including a central axis of said bar-like light source and perpendicular to said rectangular light exit surface, and whose thickness is reduced from said thick portion toward said thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on both sides of said parallel groove; and

narrowing an end portion of said parallel groove toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface, based on a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions.

26. (previously presented): The method according to claim 25, wherein said peak value of relative illuminance or relative luminance at said first portion of said rectangular light exit surface is three or less times as large as said average value of said relative illuminance or relative luminance at said second portions of said rectangular light exit surface.

APPEAL BRIEF UNDER 37 C.F.R. § 41.37
U.S. Application No.: 10/588,935

Attorney Docket No.: Q96062

EVIDENCE APPENDIX

NONE.

APPEAL BRIEF UNDER 37 C.F.R. § 41.37
U.S. Application No.: 10/588,935

Attorney Docket No.: Q96062

RELATED PROCEEDINGS APPENDIX

NONE.

PATENT APPLICATION

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re application of

Docket No: Q96062

Osamu IWASAKI

Appln. No.: 10/588,935

Group Art Unit: 2875

Confirmation No.: 2409

Examiner: Danielle N. Dunn

Filed: August 9, 2006

For: LIGHT GUIDE PLATE, AND PLANAR LIGHTING DEVICE AND LIQUID CRYSTAL
DISPLAY DEVICE USING THE SAME

SUBMISSION OF APPEAL BRIEF

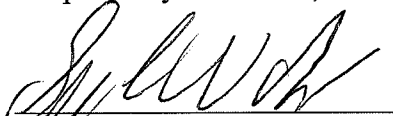
MAIL STOP APPEAL BRIEF - PATENTS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith please find an Appeal Brief. The USPTO is directed and authorized to charge the statutory fee of \$540.00 and all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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WASHINGTON OFFICE

23373

CUSTOMER NUMBER

Date: October 3, 2008